Space Qualified Non-Destructive Evaluation and Structural Health Monitoring Technology, Phase II

Completed Technology Project (2005 - 2007)

Project Introduction

Encouraged by Phase I accomplishments, the proposed Phase II program will significantly mature and align the development of a Space Qualified Non-Destructive Evaluation & Health Monitoring system with the needs of NASA. We are systematically working to improve the TRL to 5 at the end of Phase II and formulate commercialization and product development strategy beyond Phase II. The proposed health monitoring system features three innovative technologies: excitation of preferential Lamb/Rayleigh wave modes; utilization of phased array concepts; and utilization of software algorithms rather than hardware for beam forming and signal analysis. The ability to detect cracks, corrosion, disbonds, and cracks under bolts for a stiffened panel was demonstrated in Phase I. The detection methods used were pitch-catch, pulse-echo, phased array, and electromechanical impedance. To efficiently and cost-effectively achieve Phase II objectives, NextGen has teamed with Lockheed Martin Space Systems - Michoud Operations to test the proposed system in realistic environment. A cryogenic, composite LOX tank, built by Lockheed Martin for the X-34, is currently in a test fixture at NASA Marshall and will be used for evaluating our system. Additional tests will be performed to validate the durability and survivability of the system for space certification.

Primary U.S. Work Locations and Key Partners

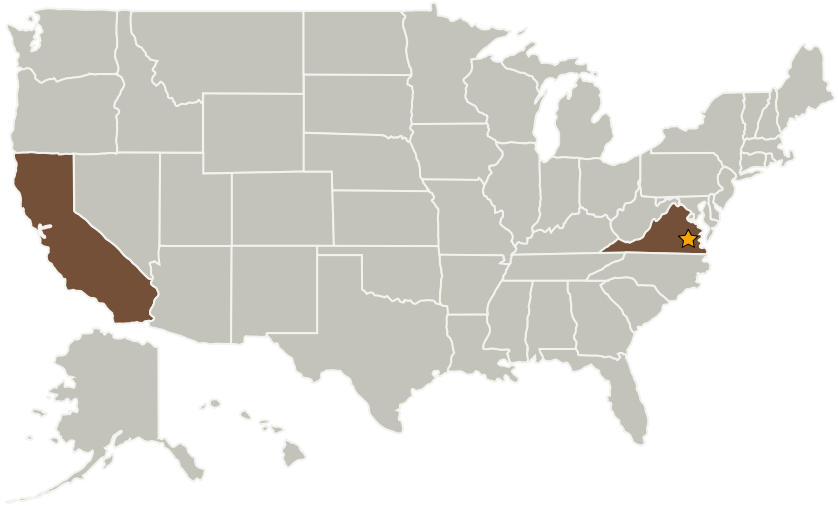

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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
NextGen Aeronautics, Inc.	Supporting Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB)	Torrance, California

Primary U.S. Work Locations	
California	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.2 Structures
    - TX12.2.3 Reliability and Sustainment